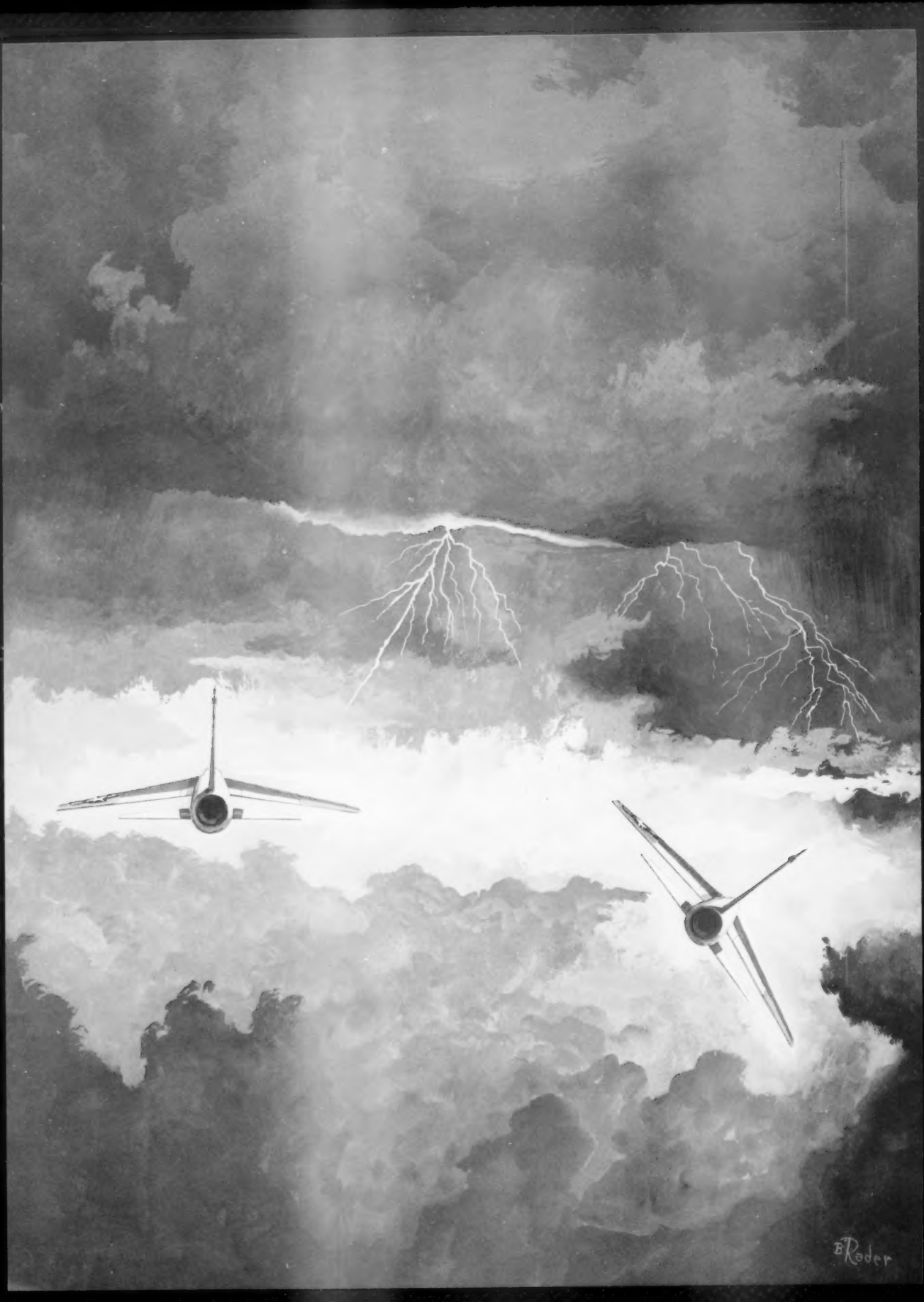
approach

MAY 1978 THE NAVAL AVIATION SAFETY REVIEW


B Reder

The pilot in command is responsible

"THE pilot in command is responsible for the safe and orderly conduct of the flight." From day one of flight training, this statement from OPNAV 3710 has been drummed into naval aviators. Unfortunately, what appears to be a straightforward and clear-cut statement can turn out to be somewhat less than clear under a variety of circumstances that an aviator may find himself. Consider the following situations:

- A junior F-8 pilot is flying as wingman in a flight led by a senior, experienced *Crusader* pilot. The nugget is running very low on fuel, yet the flight leader keeps pressing on toward the filed destination. What should the junior aviator do?
- An F-4 pilot is launched for a night mission off a CV. He and all the other air wing night fliers have been directed to shoot a touch-and-go prior to their arrested landing. When recovery time comes, however, the pilot learns that the airborne tanker is sour, and he computes a below bingo fuel state upon arrival at the ramp. Does he drop his hook to trap, or does he follow the captain's directive and shoot a touch-and-go?
- A flight of two aircraft are flying an instrument training flight. Their route of flight is taking them toward an ominous looking thunderstorm, so the lead aircraft requests deviation around the bumper. Center, saturated with traffic, cannot approve the deviation and instructs the aircraft to proceed straight ahead. Should the aviator take his chances with the storm or disregard the ATC clearance and deviate?

Let's take a look at these actual occurrences in a little more detail and discuss the action the individual pilots took. As you read, decide what *you* would have done (realistically) if you had been the pilot in command.

The first situation involved a senior F-8 pilot and a nugget wingman returning to Homebase after a cross-coast CARQUAL period. The student had not slept at all the night prior to the flight, as he was standing by waiting for improved weather to launch. When the weather never did reach night CARQUAL minimums, the F-8s flew off at daybreak to return home.

During the flyoff, the replacement pilot noted DME problems on his TACAN, and his radio broke up continually. At the first refueling stop, he discussed the problem with his flight leader, but they decided to launch anyway.

A droops-up climb was briefed, followed by extension of the droops to the cruise position when the aircraft leveled off at altitude. The RP executed the climbout as briefed, *but forgot to extend the droops at level off.* The effect of this oversight was to increase fuel flow by 500 pounds per hour. Fuel planning to destination was close, anyway, and this made it critical. Consequently, the student reported below planned fuel specs at each fuel checkpoint, with the difference increasing. Over 600 miles from destination, flying into an 85-knot headwind, the replacement pilot reported 3900 pounds of fuel remaining.

The lead recomputed fuel required to destination and estimated the wingie would land with 700 pounds – but

this computation was based on a droops-down configuration. Consequently, when the flight started its descent from altitude approximately 80 miles out, the wingman was reporting just slightly over 500 pounds of fuel.

At this point, the flight leader requested separation of the flight for individual handling of the low fuel aircraft. Center asked if he was "declaring an emergency," to which the leader replied, "Negative, he's at minimum fuel, though."

Left on his own with minimum fuel, the pilot started getting panicky. Passing 28 miles from destination at 10,000 feet, he was reading 400 pounds. Passing 7000 feet, Center instructed the pilot to "maintain 4000 feet." The pilot responded, "Center, unable to do so – I'm down to nothing and I'm gliding in . . . "

Center's response was to declare an emergency condition. Control of the F-8 was passed to Approach, which informed the distressed aircraft that the nearest airport to him was a civilian field, 5 miles short of the Navy destination. The pilot replied, "I'll try that one . . . I'll never make it . . . give me a clear in, please."

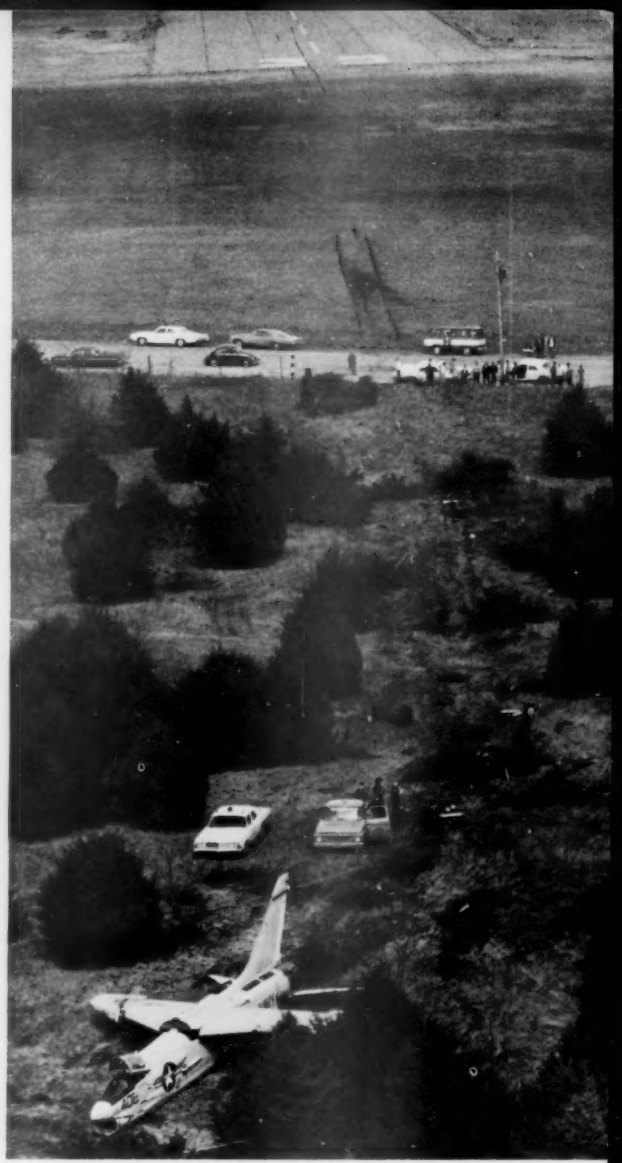
The pilot requested the length of the runway at the civilian field and was told 5200 feet. With the field in sight, the F-8 was given clearance to land on any runway, winds light and variable. The tower passed that Runway 13 was 5400 feet long, but Runway 17 was closer.

The panicky pilot set up for Runway 17 and made his approach at an excessive speed with the boundary layer control off. The aircraft touched down 2400 feet from the approach end of the runway, porpoised once, and touched down again 621 feet from the end of *the 3800-foot runway!* The aircraft came to rest 130 feet off the end of the runway after cutting through two drainage ditches, a road, and some small cedar trees. Fortunately, the pilot suffered only minor bruises.

As the mishap board pointed out, responsibility for this accident had to be shared at least equally by the flight leader. It was his decision to press on to destination despite several suitable military fields en route. He also separated from his wingman when he was needed most, leading to a series of bad headwork decisions by the junior aviator.

Nevertheless, the young aviator needn't have let himself be led into a situation that was clearly "turning to worms." He could have more emphatically expressed his desire to land short of the destination. Failing to convince the flight leader to do this, he could have taken it upon himself to divert to a closer field prior to reaching a critical fuel state.

It's easy to point out the pilot's errors with the benefit of hindsight. But realistically, the average young aviator – particularly in a formal training situation – is going to be extremely reluctant to question the judgment of a senior aviator, let alone override his decisions. And, in most cases, this is as it should be. There is no aviator alive, however, regardless of rank or experience, whose judgment is infallible. Therefore, every aviator must make his own personal judgment about the situation as it affects his aircraft and his ability to ensure its safe operation.



The pilot in command is responsible for his aircraft even if he's only a junior wingman.

The second example cited resulted in no aircraft damage or personal injury – but the questions arising out of the situation are very interesting. In this case, the F-4 jock was forced to weigh his responsibilities as pilot in command against the directions of the captain of an aircraft carrier – a heavy decision!

The incident occurred during a time when the carrier had operated infrequently, especially at night. Consequently, the ship's captain directed that night fliers would shoot a touch-and-go prior to their final arrested landing. Well, the flight this crew launched on was longer than originally intended, and the airborne tanker went sour. As a result, the aircrew felt great apprehension about shooting the touch-and-go.

As they commenced their approach, the crew informed Marshal that they would be below bingo at the ramp and requested relief from the touch-and-go requirement. "Stand by" and "Wait one" were the only responses they could get.

As the approach continued, a decision had to be made. The pilot elected to drop his hook. As it turned out, the aircraft did an unintentional touch-and-go (leaving a trail of telltale sparks) but did trap on the next pass – considerably below bingo.

The shower of hook sparks (on the pass that was supposed to be a touch-and-go) did not go undetected by the captain on the bridge. A personal interview was arranged for the pilot after he landed.

How would you have handled this situation? An accident caused by fuel starvation, regardless of the circumstances leading up to it, would almost certainly be charged, at least in part, to the pilot in command.

The third episode occurred during circumstances familiar to almost all aviators. The two aircraft were headed directly toward a large thunder bumper. The lead requested a deviation around the buildup, but due to a saturated ATC condition, the request could not be approved. The lead pilot chose to penetrate the storm. It was a bad decision.

Communications were lost with the lead shortly after he entered the storm. The wingman lost visual contact also and made a 180 to return to VFR conditions. Center lost radar contact with the aircraft in the storm, and reports of a crashed aircraft shortly thereafter confirmed the worst.

The result of one pilot in command's failure to take the "necessary action to ensure safety of flight."

In retrospect, the pilot involved in the accident should obviously have done *anything* to avoid flying into what proved to be a deadly thunderstorm. But how many times have you penetrated bumpers that didn't turn out to be as bad as they looked, or which didn't warrant declaring an emergency, violating an ATC clearance, or diverting to a new destination?

These three examples by no means indicate the entire scope of the authority problem. Nor is the scope of the problem limited to tactical jet aircraft. Transport pilots with senior passengers aboard often feel pressure to compromise the safe operation of their aircraft in order to deliver their passengers to their destination on time. The concept of the NFO mission commander can set the stage for conflicts between mission completion, as desired by the NFO mission commander, and safe operation of the aircraft, as determined by the pilot in command. Or, junior helicopter aircraft commanders flying with senior copilots may feel military pressure to go along with the senior's desires even if it may have impact on the safe conduct of the flight.

Nothing can be written establishing "rights" and "wrongs" about situations such as these because every circumstance is different. About all you can do is weigh the consequences of each course of action and then take the best alternative. Sometimes, you may find yourself between the proverbial "rock and a hard place," where it becomes necessary to take the action that you think will offer the least undesirable consequences.

In an attempt to help you make these kinds of decisions, consider the following:

- The consequences of a crashed aircraft and personal injury would seem to outweigh just about any other consequence.
- In the three examples described in this article, the two pilots who waived their authority as pilot in command ended up in accidents while the other brought back his aircraft and crew safely.
- It's better to be able to justify your actions in person than to have the mishap board try to figure them out by sifting through aircraft wreckage.

The rules are written to allow the pilot in command wide latitude to do what is necessary to ensure the safe operation of his aircraft. Take advantage of these provisions. With only a few well defined exceptions (embarked flag, etc.), the pilot in command is responsible – regardless of his age, experience, rank, or position. Don't abdicate that responsibility. ◄

AIR BREAKS

4

Don't Trim on Takeoff. The scenario is not uncommon in the A-4 community. Two aircraft take the runway for a section takeoff. The wingie, like all naval aviators, wants to look sharp during the maneuver. Manual fuel check complete, the lead raises his hand to signal start of the takeoff roll. Hand down, full power, judicious braking to stay on bearing, throttle moving constantly to adjust position . . . the wingman's full attention and concentration are on the lead. Lead's nosewheel breaks ground, the wingman tries to match his rotation rate. NOTHING HAPPENS! The wingman pulls back further on the stick, but still the *Skyhawk's* nosewheel is glued to the ground. The pilot's first reaction is to check the trim gage. Sure enough, the trim is full nosedown. Depending on the pilot and the circumstances, an abort or immediate up-trim of the elevator via the normal trim button or override lever prevents an accident from occurring (hopefully). At the very least, nobody was impressed by this section takeoff.

So what happens? Material failure or runaway trim? Perhaps, but it might also have been pilot induced. How? The A-4 NATOPS calls for pilots to apply forward stick pressure during takeoff roll to prevent the nosewheel from bouncing. When a pilot is making a section takeoff, his full concentration is on staying in position. Under such conditions, it is very easy to rely on habits. A pilot's natural tendency when he feels forward stick pressure is to trim it out. Of course, he never will succeed on the ground, and the end result is full nosedown trim. And the *Scooter* just doesn't want to take off with no up-trim.

This potential hazard has occurred to quite a few A-4 drivers. Flight leaders, do you brief this when you contemplate section takeoffs? Training command instructors, is a caution against this in the FTI, phase lecture, or SOP? All *Skyhawk* pilots, do you know trim emergencies cold, and have you decided *well in advance* what you're going to do if you can't rotate at rotation speed? This problem has been well identified. Let's do everything possible to prevent it from causing an accident.

Antenna Glitch. A C-130 was tooling around on a training flight. The pilots were flying in an orbit at 13,000 feet when the aircraft was flown into some stratocumulus clouds. Both the long and short trailing wires were extended and the antennas were hot.

Light icing, light turbulence, and occasional lightning were encountered. The rest of the flight was uneventful, and after about 1½ hours, the pilots returned to base.

After landing and shutting down, it was discovered that the two tail connectors of the port dogleg antenna had released in flight. One of the loose ends of the dogleg antenna was wrapped around the short trailing wire antenna. Complete separation had not occurred.

It was determined that initial failure of the dogleg antenna was due to separation of the strain insulator. Coincidentally, the sleuths also found the starboard mast was incorrectly installed.

Jettison the Load. The crews of a CH-53 squadron were involved in a series of external lifts between two points, 85 miles apart. One helicopter picked up a radar test van 10 feet long, 8 feet wide, 7 feet high, filled with miscellaneous equipment weighing 6500 pounds.

APPROACH is a monthly publication published by Commander, Naval Safety Center, Norfolk, VA 23511. Subscription price: $11.70 per year; $2.95 additional for foreign mailing. Subscription requests should be directed to: Superintendent of Documents, Government Printing Office, Washington, DC 20402. Controlled circulation postage paid at Richmond, VA.

The helicopter was configured with one sling assembly, rigged with a nylon and chain leg cargo sling. The takeoff and climbout to 5500 feet were uneventful. The HAC transferred control to his copilot while cruising at 60 KIAS. The load was stabilized and riding easily.

After several minutes in level flight, the load began a fore and aft oscillation which progressed into a worsening pendulum effect. The copilot reduced power and began to slow down to try to stabilize the load.

The HAC then took control and started a descent, continuing to slow down until he reached 20 KIAS. Then he applied power, hoping that a positive force against the external load would alleviate the oscillations. Nothing worked, and with the onset of severe aircraft buffeting – 20 degrees noseup to 30 degrees nosedown – the HAC jettisoned the load. The HAC felt that this was necessary to avoid a catastrophe. Meanwhile, various caution lights had begun flickering.

When the load was released, all violence ceased, and the helicopter returned to normal flight. The total time between the beginning of the oscillations and jettison was about 2 minutes.

The pilots encountered some clear air turbulence which they blamed for the change in the riding characteristics of the load. Earlier in the day, they had encountered moderate turbulence at 3000 feet, but another helo cruising at 5500 feet reported no difficulties. Thus, they had decided to transit the area at 5500 feet.

A portion of their route, where they jettisoned the load, was above a channel separating two islands. The channel is fed by prevailing winds, which create a venturi effect above the channel because of mountains on each island. Turbulence, however, is usually restricted to altitudes of 3000 feet and below.

The pilots tried every reasonable way to avoid any turbulence by planning their flight at 5500 feet. They knew that turbulence was not desired with a van as an external load.

NATOPS includes a lengthy discussion of various external load characteristics, riding qualities, a caution about external loads in turbulence, and standardization of recovery techniques. For example, there is a note that oscillations can be expected at 70 KIAS or more, or when entering a descent too rapidly. In this incident, neither condition was met, but oscillations were uncontrollable. NATOPS further advises that a drogue chute should be used since vans are unstable to a degree at all speeds.

The squadron used the incident to brief all pilots on recovery techniques, the channel phenomenon, and control application for safe external load performance.

A Dash of Grommet. While straight and level at 100 KIAS and 900 feet, the engine RPM aural and light warnings came on. The student pilot initiated autorotation while his instructor took the controls. The N_g was noted at 10 percent. The instructor broadcast a Mayday and headed toward a field. The location of the field in relation to the aircraft at the time of engine failure meant using S-turns to lose altitude. A sideward flare was then used to dissipate airspeed – while keeping the tail rotor clear of obstructions. Prior to touchdown a pedal turn aligned the aircraft with the desired track over the ground. The TH-1L was landed safely in a farmer's bean field.

There had been no gage discrepancies/warnings or caution lights prior to failure. Local investigation revealed two unidentifiable rubber grommets placed between the fuel shutoff valve and fuel fitting. The grommets are not a part of the fuel shutoff valve. They had worked loose, and one was cut by the action of the shutoff valve. Small pieces lodged at the outlet side grommet, resulting in fuel starvation.

The grommets were removed, and fuel lines, filters, and strainers were inspected, the shutoff valve was reinstalled, and the aircraft was returned to service. Random inspection of 10 other aircraft revealed no similar grommet installations. The prompt, correct response and skilled airmanship of 1stLt Androskaut prevented the loss of an aircraft and possible injury to the pilots. ◄

THE BREAKS WITHOUT BRAKES

MAINTENANCE work to incorporate an airframes change on an A-7 had been completed, and no functional checkflight was required. However, a pilot was assigned to fly an hour to check the operation of the ADC (air data computer).

The pilot took off and spent 30 minutes in the local area checking the ADC and reported no discrepancies. He then entered the GCA box pattern and flew five approaches. On the downwind leg of his last approach, he used the emergency gear and flap extension procedures for personal practice. The pilot received a safe down and locked indication for both.

The pilot continued a normal meatball approach and flared slightly before touchdown, due to a 6000-pound fuel load. He used aerodynamic braking to slow down, followed by steady, antiskid braking at 90 knots until a safe taxi speed was reached, about 6000 feet down the runway. The aircraft rolled another 2500 feet prior to reaching an angled, high-speed turnoff onto the taxiway.

The pilot by this time had secured the antiskid switch and selected nosewheel steering. After the turnoff, toe brakes and right rudder were applied but there was no response. The aircraft began a very gentle right turn traveling from the left edge of the taxiway toward the right edge. The pilot cycled nosewheel steering and antiskid switches to regain braking and steering, but without success.

He secured the engine at the right edge of the taxiway. The A-7 traveled out into the boonies, 300 feet across hard dirt and a concrete parallel taxiway, and finally another 80 feet of hard dirt. The pilot tried one unsuccessful application of the emergency wheel brake system. The aircraft stopped near a concrete ramp area, after the cross-country trip, *none the worse for wear.* Later it was hoisted onto the ramp and towed to its hangar.

The ensuing investigation considered many factors which included:

- The pilot's statement that the flap handle was placed down following gear and flap extension on the downwind leg.
- The flap handle had been out of ISO earlier on another approach, and the utility wheel brake accumulator should have been charged.
- The accumulator, when charged, will provide enough pressure for a full stop under some conditions.
- When the antiskid is on, accumulator pressure will bypass through the antiskid control valve in about 20 seconds.
- Decelerating from 90 knots to safe taxi speed at the aircraft's weight and speed would take less than 20 seconds.
- The utility wheel brake accumulator pressure read 700 psi, and the emergency pressure read 2900 psi after the incident.
- After a dropcheck and a couple of functional checkflights, no discrepancies were found, nor were there any malfunctions of the systems.

The conclusion was that the pilot inadvertently left (or returned) the flap handle in the ISO-Utility position (see "Up, Down, Isolate – Pick the Right One!", JAN '78 APPROACH). This, of course, rendered the normal brakes and nosewheel steering inoperative. In an actual emergency, extension of the gear and flaps would be followed by an arrested landing. Also, the checklist calls for the pilot to blow the flaps first, next the gear, and then place the flap handle down. All pilots must remember that anytime an emergency procedure is practiced, preplanning and execution of all checklist steps is required for a successful conclusion. ◄

A PART OF CHUCK IS MISSING

His "K," not his head

By VS-22

IT'S easy to lose sight of the continuing need for proper flight deck equipment in the day-to-day pressure of operations. Safety officers and supervisors often become chagrined when they find flight deck workers either lacking proper equipment or not using it.

While deployed in late 1977, our man Chuck proved the value of properly worn, complete equipment. While conducting a plane captain inspection, his hand accidentally touched the tailhook "J" hook. The hook crashed down, striking Chuck in the "K." The hook not only cut off part of the "K," it penetrated the helmet shell and backing pad, leaving Chuck a small bruise on his forehead – but no other injury except to his pride. Had the helmet not been on or had it been improperly worn, Chuck would probably have suffered a severe concussion or possibly been killed.

Remember – flight deck hazards never go away. Chuck lost part of his "K" – not his head – because he wore his flight deck hardhat. Do the men in your squadron wear theirs? Do you wear yours? ◄

The flight to the ship was a short one. The ship was at anchor, only a mile from the beach. However, the thick haze and fast receding daylight made the pilot strain to make out the signals of the LSE, as the aircraft slowed to a creep, just off the deck edge. Shortly after the helo began to stabilize over the landing spot a high yaw was experienced, concurrent with a pitch down. The pilot didn't like the setup and quickly slid over the side. He eased the helo into forward flight to return to the beach. What had happened?

Unsymmetrical Recirculation Effects

By LT Emmett J. Lancaster
HC-11

POWER settling is a phenomenon familiar, in theory at least, to all helicopter pilots. NATOPS describes power settling as a condition which may occur when the helicopter is flown at a high-power setting and low airspeed and rate of descent, a condition caused by recirculation of the rotor downwash back through the rotor system. No mention is made of hovering situations in which recirculation of the rotor downwash may occur, possibly placing the helicopter in a hazardous position. The intent of this article is to describe briefly the aerodynamics of the helicopter when the rotor downwash is recirculated unsymmetrically, due to interference.

The effect of recirculation can be evaluated by examination of an element of the blade as shown in Fig. 1.

Two points should be noted. First, symmetrical recirculation about the rotor requires a higher collective blade pitch, and the induced power (power required to overcome the resistance to rotation due to the rearward inclination of the blade element lift) is increased. Second, any unsymmetrical recirculation will also result in a higher collective pitch requirement, increased induced power, and, additionally, a requirement for an altered cyclic pitch. In either case the net effect on helicopter performance is equivalent to that in a climb.

A helicopter operating in a no-wind hover is shown schematically in Fig. 2. The structure (Fig. 2b) represents the hangar on nonaviation ships, the island on carriers, or a building. The rotor downwash is being recirculated

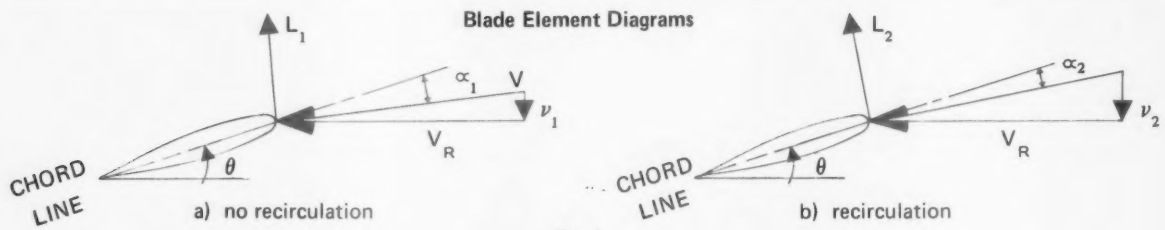


Fig. 1

L = Blade element lift
V_R = Tangential (linear) velocity due to N_R (rotor RPM)
v = Local rotor downwash velocity (equal to induced velocity plus recirculation velocity)
V = Resultant relative wind
α = Blade section angle-of-attack
θ = Local blade pitch angle (for a given blade, a function of collective and cyclic pitch)

$$V_R, \theta = \text{CONSTANT}, v_2 > v_1 \therefore \alpha_2 < \alpha_1 \ddagger L_2 < L_1$$

Recirculation increases the flow velocity perpendicular to the rotor which decreases the blade angle-of-attack, hence decreasing lift and local induced velocity for a given pitch setting. To maintain a given amount of lift, more blade pitch is required to reestablish the required rotor-induced velocity. (A given average induced velocity corresponds to the given lift, all other things being equal.)

unsymmetrically because of the presence of the structure. This situation results in increased power requirements and a need to retrim the rotor. A helicopter moving into the influence of an adjacent structure (Fig. 2b) will encounter a dissymmetry of lift. This will result in the blade on the structure side flapping down in the reduced lift area. As shown in Fig. 3b, this flapping results in the rotor system

tilting forward (or backward, depending upon which side of the aircraft is adjacent to the structure). Tilting the rotor system tilts the resultant rotor thrust vector in the same direction. Tilting the rotor thrust vector causes a slight decrease in the thrust component supporting the helicopter's weight and creates a significant horizontal component. The slight decrease in the vertical thrust component and the increased induced power requirement will cause the helicopter to settle unless collective and torque are increased. The horizontal component will cause the helicopter to move in the direction of the component unless opposite cyclic is applied to retrim the rotor. The increase in torque will, for the single-rotor helicopter, result in a right yaw unless left pedal is applied.

The effect of unsymmetrical recirculation as depicted above could result in several undesirable situations. If the helicopter is in a hover, a cockpit distraction diverting both pilots' attention from the LSE could result in a forward drift. If both pilots are paying attention to the LSE and maintaining a stable hover, it may be possible to run out of collective, cyclic, or pedal (for single-rotor helos) before the pilots are aware of what is happening. Add to the picture high gross weight and density altitude, and the collective available will be reduced, making it that much harder to recover from the situation.

Unsymmetrical recirculation requires three basic ingredients:

- A structure near the helicopter (as shown in Fig. 2b).
- No/low wind (5 knots or less) or wind being blocked out by the structure.
- A rotor system developing lift (helo in hover or transitioning to/from hover).

To get out of unsymmetrical recirculation effects, it is necessary to stop the recirculation. This can be done by lowering the collective and landing, which decreases the downwash velocity, or by flying out of the recirculating air. For tail rotor configured helicopters, when lifting into a hover in an area where unsymmetrical recirculation effects may be encountered, the pilot should anticipate using more pedal than would normally be expected.

In a recent incident in which it was suggested that unsymmetrical recirculation was a contributing cause, the 62-foot diameter rotor system was approximately 20 feet from the structure. In this incident, the single-rotor helicopter experienced a right yaw as soon as its wheels

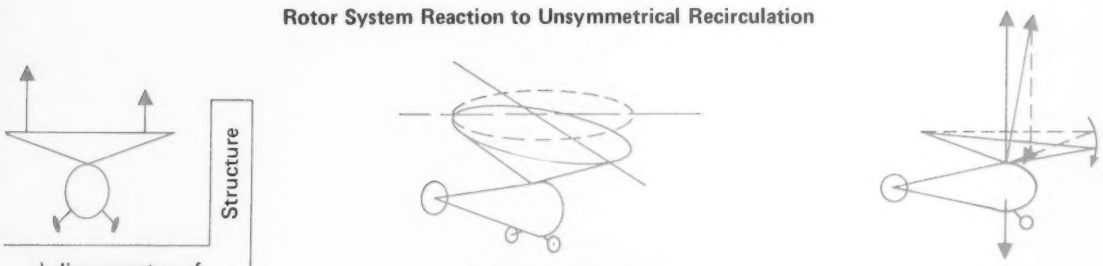
No-wind Hover

a) no interference with rotor downwash

b) structure interfering with rotor downwash

Fig. 2

Rotor System Reaction to Unsymmetrical Recirculation



a) dissymmetry of lift caused by unsymmetrical recirculation

b) tilting of blade tip path plane

c) tilting of resultant rotor system thrust vector

------ original position of rotor system
—— resulting position of rotor system due to dissymmetry of lift

Fig. 3

Opening hangar doors will reduce the structure's interference with rotor downwash.

broke ground contact while lifting into a hover. The structure was on the right side of the helicopter.

Although the likelihood of encountering situations where the worst combination of the ingredients for unsymmetrical recirculation exist is probably small, the possibility remains. (Some accidents in the past may even have been attributed to other causes without considering unsymmetrical recirculation.) Therefore, helicopter pilots should be aware of it. If possible, prolonged hovering should be avoided in an area where unsymmetrical recirculation may be encountered. Something to consider is objects which will break up the recirculating air; such objects would be GSE, catwalks, overhangs, or open hangar doors. In general, the cleaner the structure, the worse the recirculation will be. If it is necessary to hover under such circumstances, the pilot should be prepared for trim changes about all axes of the helicopter and for unusual variations in the power requirements. ◄

Bravo Zulu

LCDR Jon Barto
and
LT Frank Brown

LCDR Jon Barto (left) and LT Frank Brown (right).

THE flight was the first flight for the F-4J since coming out of rework. LCDR Jon Barto and his RIO, LT Frank Brown, had performed their preflight, engine runup, and controllability checks with no discrepancies noted.

On takeoff roll, after the aircraft went into afterburner, the RIO notified the pilot that his airspeed indicator was inoperative. Glancing quickly at his own, LCDR Barto noticed that his airspeed indicator was functioning satisfactorily. By this time the F-4 had commenced a rapid drift to the right which the pilot tried to correct with left rudder and left aileron. At this point he was already beyond abort speed. After rotating the aircraft he took off right over a runway distance marker.

After becoming airborne, the RIO noted that the rudder was fully deflected to the right. Despite this, LCDR Barto was able to maintain a wings-level attitude with nearly full left aileron. Declaring an emergency, the crew followed NATOPS procedures, burned down, and performed a controllability check. Since he was not able to maintain adequate control below 200 knots, LCDR Barto blew the utility hydraulic system IAW NATOPS. The rudder centered by airload, but there was no manual control authority. Subsequently, an uneventful arrested landing was made.

Following the flight, an inspection revealed that the bolt which attaches the rudder control rod assembly to the rudder power control cylinder assembly was missing. Not surprisingly, it was found in the aircraft, but the washers, nut, and cotter pin were not found.

It was surmised that only the bolt had been placed in the linkage and had vibrated out during takeoff.

By their superior performance, LCDR Barto and LT Brown saved an F-4J from possible destruction and themselves from an ejection, with serious injuries a possibility. Well done to a crew who was prepared and reacted in a professional manner.

An "APC" for aviation headaches

By LCDR Robin Springer
Naval Air Test Center
Aviation Safety Officer

WE'RE not talking about aspirins here. This APC you take *before* the headache, not after it's killing you. It's called an Accident Prevention Council.

The Accident Prevention Council program was recently instituted at the Naval Air Test Center, Patuxent River, MD to identify hazards before accidents or incidents occur. The Accident Prevention Council is a new element of NATC's accident prevention program which operates via proaction to control failures that lead to aircraft mishaps.

Proaction? No, you won't find that word in the dictionary, but it describes the goals of the APC very well. Proaction is a word coined at the Naval Air Test Center. It's a combination of the prefix "pro" which means projecting or prior to, and "action" which is something done or effected. If you are preventing accidents, you are proacting. If you are investigating accidents, you are reacting. The spiraling cost of aircraft and the priceless loss of life in accidents dictate proaction in aircraft accident prevention. Hazards must be identified, analyzed, and eliminated prior to their causing a mishap.

An APC has been formed for each type aircraft assigned to the Naval Air Test Center. Since NATC operates a wide variety of aircraft, there are 25 councils. Each council is chaired by the NATC NATOPS model manager for that type aircraft. The membership is comprised of representatives drawn from each discipline associated with the operation and maintenance of the aircraft (i.e., pilots, NFOs, enlisted aircrews, test engineers, and maintenance ratings). A full spectrum representation is essential to this systems safety management approach to accident prevention.

The primary goal of the APC is to facilitate communication between the various disciplines to eliminate hazards. The impact of one element (pilot, maintenance, etc.) upon another and upon the entire operation can be discussed. Each APC is encouraged to ask the questions

SH-3 Accident Prevention Council

Chairman: SH-3 NATOPS Model Manager (Rotary Wing Test Directorate)

Members:

Maintenance	Aircrew	Engineer
Maintenance Control	H-3 Pilots	ASW Systems Engineer
Material Control	AWs	Fleet Support Engineer
QA	NFOs	Air Vehicle Engineer
AC Division		
AV/ARM Division		
Line Division		
Check Crew		

Fig. 1

"What if . . . ?", "Why . . . ?", and "Why not . . . ?" in its critical view of all old and new operations to identify hazards. Particular emphasis is placed on hazards associated with the interface of the various elements that operate and maintain the aircraft. Through group interaction, identified hazards can be analyzed and assigned a priority based on the accident potential. As a result, each member will know the significance of the hazards which affect his element and where they lie in relation to other identified hazards. Only after the risks are evaluated as to seriousness, probability of occurrence, cost, and Test Center objectives are solutions suggested. As a final step, the APC reports its findings, its recommended corrective actions, and milestone dates for correction of deficiencies.

Let's take a look at a typical APC – in this case for the SH-3 aircraft. Typical makeup of the council, as depicted in Fig. 1, shows the variety of members involved.

The SH-3 APC meets regularly (the exact frequency has yet to be determined) on a priority basis. Agenda items are requested in advance of the meeting, but add-on items are encouraged at any time during the meeting. To see how the APC functions, consider the following actual problem that cropped up last summer at NATC:

A torpedo was loaded aboard an SH-3 as part of a test that was being conducted. During the same period, the aircraft was also being used for other tests, and the aircraft was being flown with the torpedo aboard even though it was not required for these tests. Investigation revealed that the weight of this extra load increased minimum single-engine speed by 10 knots – an obvious safety consideration during the hot summer months. Yet removing that torpedo and reinstalling it on a regular basis would mean much extra work for the undermanned ordnance crew, a delay in test program completion, and potential safety problems.

This case was a good example of how one problem cuts across squadron elements. The pilots were concerned with the flying qualities of the loaded SH-3. The engineers were concerned with completing their tests on schedule. And Maintenance Control was concerned with the management and paperwork associated with the evolutions. All in all, many people were involved, all with legitimate concerns and problems.

An APC would approach this problem by first hearing from all the people concerned so that everyone could gain some understanding of each other's problems. Then alternatives for corrective action would be solicited, a priority assigned to this problem, and recommended action firmed up. In this case, improved scheduling of the aircraft enabled the H-3s to fly without the torpedo when it was not needed, while it simultaneously avoided the need for numerous torpedo loads and unloads.

As can be seen from this example, our APC concept is simply a systems approach to anticipating and correcting problems before they become cause factors in an accident. Is the systems approach to safety management working in your unit? Are you looking ahead? Identifying hazards? Evaluating them with respect to your mission and your environment? Are you proacting? Or are you reacting to hazards? If you are hung up in the reaction syndrome, possibly an APC will cure your ills.

Form an Accident Prevention Council for each type aircraft your unit operates. It doesn't matter if your activity flies only one type of aircraft – the principle is the same. Include representatives from each discipline that is associated with the operation and maintenance of that aircraft and apply systems management to analyzing and eliminating hazards. Proact, don't react! The APC can be a valuable device in preventing the *Excedrin* headache caused by an aircraft accident. ◄

This accident occurred because the pilot failed to exercise proper judgment in the selection of a suitable landing field (under the existing circumstances), and having made his decision, failed to operate his aircraft in such a manner as to prevent the aircraft from leaving the runway.

C-118 HYDRAULIC

AIRCRAFT emergencies can be categorized into two groups: those which can be practiced and those which only can be simulated. The cause of this accident was an emergency falling into the latter category. This is not to infer that there weren't procedures, because the opposite is true. There were definite procedures to be followed, and when those procedures weren't followed, trouble ensued.

The weather was not the best for the flight. There were multiple layers of clouds, rain for the entire route, a few thunderstorms, and turbulence in the clouds. The forecast for destination was 3500 broken, 7 miles (with temporary 2000 overcast, 2 miles in rain showers/thunderstorms), winds were 240/12 with gusts to 25.

The crew of the aircraft were all seasoned performers. The plane commander had over 700 hours in model, both pilots were current in all respects, and the flight engineer was an old head with almost 1400 hours in model. There was no reason to believe that they wouldn't be able to hack a routine flight.

The flight involved leaving Homeplate, picking up about 55 passengers at another field, and delivering them to Coastville before returning to Homeplate. The first leg to the pickup point was routine, the passengers were loaded aboard, and the aircraft took off for Coastville. The flight was not particularly rough, but a passenger or two did become airsick. About 10 miles from destination, at 3000 feet, the crew noted a hydraulic fluid loss just as they were switched to Coastville GCA by Approach. They didn't know it, but the loss of hydraulic fluid was due to failure of the starboard wheelwell accumulator.

The pilot declared an emergency and requested vectors for time to troubleshoot and discuss the emergency. Let's pick up some of the transmissions between the aircraft and GCA.

0155 GCA: C-118, radar contact 10 northeast. Read back altimeter 29.66.

C-118: 29.66, and I think we have had a hydraulic failure. I'd like to have the emergency equipment standing by. Notify the line we will probably require a tow back to the terminal area.

GCA: OK, will you be able to taxi off the runway?

C-118: I think so. We have enough hydraulic fluid for the second pump, but the utility system is reading zero. I might be able to taxi all the way in. I'd like a tow just in case.

0156 GCA: Roger, say the amount of fuel you have left and the number of souls onboard.

C-118: Fifty-eight people aboard, and we have about 1800.

GCA: Turn right heading 270, descend and maintain 1000.

0157 C-118: OK. How close are we in? Let me make a 180 out here 'cause I gotta find out how much, what I have here – as far as hydraulics. I'll make a 180 if it's all right with you.

GCA: That's a negative. Turn right heading 270. Disregard, turn left heading 360, maintain 1500.

0158 GCA: Let me know if anything else develops.

C-118: I'll sure do that.

0159 C-118: We have lost our utility system. It will be a no-flap landing. That means I want a long, straight final. Stand by, I'll let you know when we're ready to come back in. I gotta see if the gear is going to free fall.

0201 C-118: Ready to come back in now.

GCA: OK, be advised the line doesn't have the pins for your aircraft and they request your plane captain have them ready when you get down.

C-118: OK, then I'll want them as soon as we stop. I want to stay on the runway. We'll put the pins in. The gear is down and we have three greens.

GCA: Lost communications, continue the remainder of a

FAILURE

TACAN 28 approach, attempt contact the tower on 340.2 or any available frequency for Coastville or Approach. Say again fuel remaining in pounds.
C-118: Eleven thousand pounds of fuel. Roger lost communications.
0204 GCA: You have traffic at 3 o'clock, 4 miles, northeast bound.
C-118: We're headed 160 degrees, 1500 feet, clear of traffic.
0205 GCA to 0210: Coastville present wind is 190/20 gusting to 24. Your crosswind component is port 20. Turn right heading 230. This will be a precision approach to 28 with 6300 feet of usable runway. You are now 9 miles east, straight in. Begin your descent and maintain 1000. Your missed approach procedure is to climb to 1500, heading 280, stand by this frequency for further instructions. Acknowledge.
0211 C-118: Roger position and instructions. Give us a wind check now. I have the runway in sight. I'll go visually. Just give me glide slope information.
GCA: Roger. Winds now 210/14 with gusts to 23.
C-118: OK, I'd like to have continuous wind information – about twice more before we touch down.
0212 GCA: Maintain 1000, 6 miles from touchdown.
0213 GCA: The winds now are 210/15 gusting to 23, crosswind component port at 18. This is your 10-second gear warning.
C-118: Gear is down and green.
GCA: You are cleared to land. Slightly below the glidepath.
0215 GCA: Slightly below and holding. Wind is 180 to 210/15 to 20. One-half mile from touchdown. Contact the tower when down.

In the aircraft, the pilot had discussed the emergency with the copilot and flight engineer. Then, five cabin crewmen were briefed about the problem and directed to alert the passengers to stand by for a possible emergency evacuation on the deck. Passengers next to the emergency exits were replaced by crewmen who would be available to open the exits, if needed.

Touchdown was normal and all four props were reversed. (NATOPS directs reverse two inboard props and use the outboards for direction control.) The aircraft remained on centerline for about 2000 feet. As the pilot came out of reverse at a runway intersection, the C-118 began a slow, easy swerve to the left. The copilot had activated the emergency hydraulic pump just prior to touchdown. The pilot jumped on the binders, but they bottomed out on him and he didn't think he had any brake pressure. The pilot reversed No. 3 and No. 4 and tried to straighten the aircraft with power on No. 1 and No. 2.

The C-118 departed the runway at about 40 knots as the emergency air brakes were put on. The system didn't have time to work before the transport struck an arresting gear engine. The nose gear was driven back into the belly and the starboard mainmount sheared off.

Passengers were evacuated in about 1½ minutes. Some used the port aft escape chute, some went out over the starboard wing, and the rest went out the forward crew unit. The crash crew who had arrived at the scene in a few seconds stood by to ensure there wouldn't be any fire breakout. The ambulance, with only two corpsmen, would have been woefully inadequate if disaster had occurred, but this time all were lucky, and the medics weren't needed.

The investigation revealed a sad lack of knowledge by both pilots on what systems they had and didn't have. Neither pilot, of course, previously had made a landing using only the emergency hydraulic braking system. Few pilots ever have. Further, the pilot made no attempt to review the provisions of the NATOPS manual, but relied on his memory. For example, he forgot that wing flaps were available with the emergency system.

An endorser stated the pilot should have made better use of his engines for maintaining directional control of the aircraft. The prevailing crosswind was within the C-118 limits, and the runway length was sufficient to stop – with an extra 2500 feet remaining. However, there was another airport, within 15 miles, with a runway almost into the wind, and the wind was 5 knots less at that airport.

A question was raised concerning the pilot making quick decisions without considering the alternatives. Pilots must remember not to act hastily in cases like this. The pilot had plenty of time to consider all facets of the predicament, the action to be taken, and what options were available. Proper crew coordination dictated a full discussion and consideration of alternatives. ◄

Imprecise prec

By LT Mich
HS

IT was a beautiful, bright desert night. There was a full moon shining, the air was smooth, and visibility was better than most days at high noon on the east coast. The view during our flight had been breathtaking, but as we cleared the last range of mountains, before reaching our destination, it was time to concentrate on something other than the beauties of nature.

While we were busy with the checklists, Center handed us off to Approach and we were suddenly in another world. Whereas we had been flying with almost total quiet on Center frequency, the moment we changed to Approach you'd have thought all the aircraft in the world were shooting approaches to our destination airport.

We could hear transmissions to many aircraft and could see navigation and strobe lights flashing in the pattern. As we got closer, we were handed off to GCA. The controller established communications with us, gave us a couple of turns to identify us and line us up, and the usual GCA pattern ensued.

He told us we were 4 miles from touchdown, on glide slope, and on course. Moments later, he told us we were at decision height and should have the field in sight. He then informed us that we were over the numbers and were cleared to land. Routine? It certainly sounded like it except we transmitted that we didn't have the field in sight and we weren't over the numbers. We were still 9 miles out, maintaining 500 feet, and were executing a waveoff.

We could imagine the many questions which flashed through the minds of the controllers and anyone else on frequency. How did such a gross error occur? If the aircraft being controlled was still 9 miles out, who was over the numbers?

GCA was very busy. We commented, in the cockpit, that it sounded as if GCA had never heard of us. We later learned that GCA had not received a passdown from Approach. (First misunderstanding.)

It also seems there are two TACANs within 10 miles. GCA assumed we were over the field TACAN and we assumed they knew we were over the other TACAN, since we had reported this to Approach. (Second misunderstanding.) We didn't find out until later that GCA had no capability to radar identify us – even with a coded IFF squawk. We managed to get across to him which TACAN we had checked in over and thought this had solved the problem. (Third misunderstanding.)

The GCA controller assumed he had obtained radar identification and picked a target that had made the identical turns he had given us. From that point, he was locked on the wrong target. GCA was looking at an A-4 while talking to our helo. We were headed toward the field on the radial that would intercept the glidepath for the duty runway. The other aircraft rolled onto final 2 miles ahead of us. GCA called the correct radial for our position, but we were 11 miles out. We rogered the radial, but couldn't convince him of our distance.

We were given a heading correction and told we were on glide slope. Apparently the A-4 wasn't maintaining a good glide slope because we were put on a no-gyro basis. When we were told – 4 miles from touchdown – our TACAN read 9 miles.

The controller must have figured that we were the fastest moving helo in the west. Undoubtedly when the tower was handed off a helo, on the runway, he must have

ision approach

ael Gillespie
-35

been surprised to see a swept-winger on rollout.

GCA, after a few moments silence, picked us up for a second pass and brought us around to an uneventful landing and full stop.

This hairy story points out vividly the reason to doublecheck everything. We need to trust others, but not blindly. It's apparent that a precision approach instead of bringing you on centerline, over the numbers, can be off by miles. There are other reasons, too, for not following along blindly.

- Check with GCA and concur that he holds you. Don't just roger your position.
- Insist on a full bag of instructions – particularly in IMC.
- Assume nothing. Help controllers at all times and make sure they clearly understand who you are, where you are, and what you want.

A MATCHLESS MISHAP

By Anonymous

I AM glad we were lucky this time. I pray that there won't be another similar incident because luck might not be with us a second time. We pushed our luck too much with this one.

It started out simply enough – a routine NATOPS checkride from the model manager for both a pilot and crew. Simple – right? Routine? Could be. But let's see, and you be the judge.

The model manager aircrew evaluator planted a few discrepancies for the evaluees to find on preflight. One item was a cardboard matchstick that he stuck into the static port with it protruding just enough to be visible. After the preflight was completed, an attempt at removal caused it to be lodged further up into the port. A discussion in maintenance control followed, and it was decided to launch without removing the FOD from the static line. No gripe was written, and you guessed it, the whole incident was soon forgotten.

Another flight was flown the next day by the pilot who had just passed his NATOPS check the previous day. At an intermediate stop, the copilot was informed of the discrepancy for the first time during his walkaround. When he confronted the aircraft commander with this information, the pilot was unconcerned and answered, "We will go and use alternate air." The copilot reluctantly agreed, due to lack of maintenance technicians in type aircraft at this base and a bit of get-home-itis (it was a weekend). Sound familiar? Upon returning to Homebase, nobody remembered to write the gripe on the static system.

A gripe was finally written by that same copilot as he was preflighting for another flight the next day. The same pilot in command was ready to fly again without getting the problem fixed. This time the copilot refused to fly until it was fixed. Within 15 minutes, both pilots were strapping in and the static line had been cleared.

The lessons learned here are many:

1. Some NATOPS examiners plant discrepancies to check preflight inspections, while more thorough and competent evaluators go around with the examinee. As a result, they can gain a much better insight and demonstration of what the crew is looking for on preflight. Specific areas of concentration and important discrepancies can be discussed as they progress through the preflight.

2. NATOPS checks should be thorough, and strict adherence to NATOPS, OPNAV 3710, and OPNAV 4790 is mandatory. Serious violations should result in a down for the guilty party whether he is the examinee or the examiner. Anyone who accepts and flies an aircraft with a known downing gripe should be grounded. They might kill somebody else as well as themselves.

3. Maintenance control personnel should never release an aircraft for flight with a known downing discrepancy even though the pilot is willing to take it and the gripe hasn't been written yet. Anyone that allows this situation should be recounseled on his responsibilities and/or removed from his position of authority.

4. Gripes should be written promptly for all discrepancies. Pilots should make notes on their kneeboard of routine gripes during the preflight and flight as a good reminder for the postflight debrief. Downing discrepancies should be written as they are discovered in order that steps can be taken to remedy them immediately.

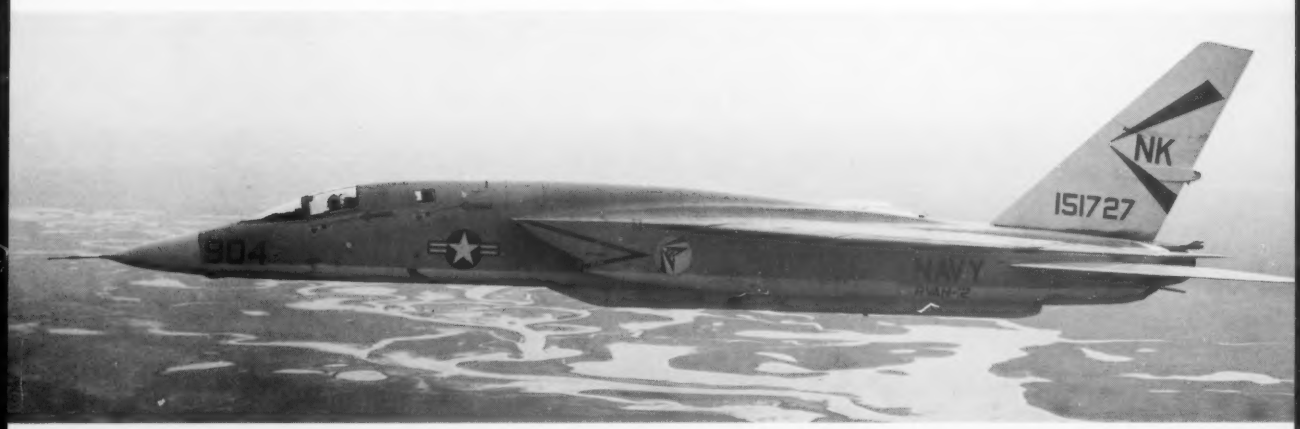
5. Alternate air is an emergency system and should only be used as such – never as the primary system.

6. Get-home-itis struck again.

As the copilot mentioned above, I learned so many things about myself during this incident that I immediately changed my "routine." I will never let my guard down again – even with a highly experienced pilot next to me. Doing so could easily be my first and last fatal mistake. To think it only took 15 minutes to fix. We were lucky this time. ◄

Reflections of an old, and bold, pilot

By CDR Tom Myers
RECONATKWING ONE



A REVIEW of my dogeared logbook the other day, while flight-time dreaming on my new staff billet, startled me. How did I possibly fly 22 types of aircraft, 630 carrier landings, and 3500 flight hours without any accidents? The first answer that came to mind was, of course, "The Lord takes care of drunks, children, and naval aviators." After some consideration of the combination of all three of those, a more realistic idea fell out. I always believed in NATOPS. My belief was strong, but my intentions to study were not always up to what I knew deep inside they should be. Ever have that feeling? Or maybe my lack of accidents was because I never had anything but solid 4.0 factory-fresh aircraft with wheels in the well! The answer to that was, of course, obvious. Anyone with 3500 hours in tactical jet aircraft will have had a few days where he wished the "huffer" hadn't worked that day, or the fuel truck had been on strike. It crossed my mind that I just might be one of the finest "sticks" in all of Naval Air. However, I was only able to convince my faithful dog of that ability upon the promise of a "treat" if he agreed with me.

If it isn't natural skill or overabundance of knowledge or divine luck or intervention – what is the ingredient that separates those that do not have accidents and those that do? Are accidents the luck of the draw? You know, the wrong place at the wrong time. Sometimes, I guess, the material failure accident is just that . . . it goes with the territory. If the truth were to be known, I guess the one factor that comes to the foreground in a pilot with a clean record is the word "concern." I do not feel there is any such thing as a "routine training mission." Each and every flight is something to be concerned about; the weather, the airplane, the field, the mission, the weather, the equipment, your ability, the weather, the aircraft envelope, the attitude of the maintenance department, the preflight, your wingman's abilities, the weather . . . (that's right, weather four times). Is all of this "concern" that you're going to heap on these items going to keep you out of trouble? No! Does it prevent close calls – the hair of your chinny-chin-chin type of thing? No, it doesn't do that either.

Then what's the point? Most problems that arise in flight are usually a result of (short of engine failure in single-engine aircraft) two or more elements. If "concern" about those many items that should give you sweaty palms breaks that chain of events that leads to a mishap, then that's the point. Conditions and your performance in all of the areas of concern vary from day to day. You can handle some weather conditions of the "pea soup" variety if you're up for it physically, if the aircraft is up on radar, navaids, etc., and the confidence of an alternate is available. You can even handle a loss of navaids if the weather is good or if you briefed the procedures with your wingman. Those weak areas that you know about in advance and can plan for are easy – it's the surprises that start those links to a mishap.

How concerned is enough? That's like how much fuel is enough – you never have enough! I never have enough fuel, enough runway, enough CAVU, enough radios, enough navaids, enough lift, enough tailwind, enough wires, enough daylight, enough flight time . . . but taking those items into consideration – I still man up and log one more flight. Join the growing club of concerned aviators. Your safety officer, skipper, wing commander, and faithful dog will be pleased! ◄

A FRIEND IN NEED

By LT Ted Robinson
COMNAVAIRLANT Staff

THE scenario was beginning to sound all too familiar. LT "Shooter" Sadler had just returned from a flight that included a day launch from the boat directly to a bombing target in section with another A-6 and a day recovery back at the ship. The launch, rendezvous, and target work had gone as advertised, with both aircrews adding solid bombing scores to their already impressive averages. But the professional conduct of the flight broke down during the trip back.

After the rendezvous overhead the target, the leader headed the flight outbound. After checking out with all the appropriate controlling agencies, the flight settled down for what promised to be an uneventful 100-mile trip back to USS GREY CITY for a cake walk Case One recovery.

The lead switched the flight to Marshal frequency at 50 miles and checked in both aircraft. Marshal replied that it was conducting a practice Case Three recovery for radar training and calibration. After acknowledging individual Marshal instructions, the leader kissed off Shooter. Instead of a normal breakaway, however, the leader observed Shooter's aircraft pull up and roll over him. In executing this unauthorized canopy roll maneuver, Shooter came uncomfortably close to the lead aircraft. In fact, it appeared that Shooter had recognized how close he was to his leader on the roll and had hesitated midstream in the maneuver. This only made things worse. For when he hesitated, inverted, his aircraft lost lift and dropped even closer to the lead as he passed over him. Shooter recovered on the port side of the lead about 1000 feet below him and disappeared off into the wild blue. Recovery back at the ship was uneventful for both aircraft.

Before the debrief in the readyroom, the leader confronted Shooter in the flight gear locker room, alone and out of earshot of others.

"What kind of a breakoff was that when we split up for Marshal, Shooter? I had a couple of friends who were killed a few years ago in a canopy roll breakoff like yours, only that pilot misjudged it just a little bit more than you did today. And you *did* misjudge it, Shooter. Your port wing came awfully close to the top of my fuselage. It could have pranged us both, man."

"Yeah, well, I guess I probably shouldn't have been so rash up there."

"Look, Shooter, I don't expect to see that kind of poor headwork again when we fly together. It's dangerous enough out here without adding any more surprises like the one this afternoon, OK?"

"OK, I'll sure watch it next time. I'm sorry. It was really a dumb move. It won't happen again."

But there have been many "next times" for old Shooter recently. His B/N had confessed privately to a few friends in the JO bunkroom late one night that he actually had to reach over and push the stick forward to avert a stall after Shooter's fourth night bolter in a row a couple of weeks ago. And this was after a rather high-pitched verbal exchange in the cockpit. Then there was the incident during Shooter's annual instrument check at the Instrument RAG. Shooter's lax attitude in the aircraft and on the ground during his annual requal prompted the RAG CO to call Shooter's skipper. Finally, Shooter had also failed a major squadron NATOPS exam that quarter, this after he had been relieved by the skipper from this very billet because of several administrative foul-up's in the NATOPS program.

The leader debated in his mind whether he should step forward and mention this incident to the safety officer or even the skipper. But, Shooter had displayed talent in the past as a pilot – at least as far as stick and throttle ability. His 75-foot CEP on the bombing range that day was an indication of just how well he could perform when he

concentrated on doing his best. Although he had trouble occasionally coming aboard the ship at night (didn't everyone?), until recently he had never given anybody cause for concern about his God-given ability to fly a high performance aircraft.

Shooter was such a popular guy in the squadron as well. Anyone who decided to take action in documenting a case against Shooter would meet formidable resistance just based on all his friendships in the squadron alone. Maybe he should go direct to the skipper, the leader thought, but the skipper had shown great reluctance in the past to take a stand on anything controversial. He was not the kind of strong leader that encouraged or solicited honest, succinct comment or dialogue from either his department heads or other officers. Maybe he should forget the whole thing. What good would it do to push the issue into the limelight when it was obviously not going to get any support from the command anyway? Shooter had realized he was in error this time, had apologized for it, and swore it wouldn't happen again. Whatthehell, Shooter was too good a tennis partner to sacrifice over an incident that was over and done with and would soon be forgotten.

In the end, the leader decided to forget about it. If Shooter had become that dangerous, surely the B/Ns that flew with him would recognize it before anyone. And they hadn't complained – had they?

Six weeks later, the accident report read that the A-6 was observed to pull up from a very low altitude into an extremely nose-high attitude followed by a fully stalled condition. The aircraft impacted the ground at a steep nosedown angle. No ejection attempt was observed, and both Shooter and his B/N received fatal injuries. The accident report stated that the pilot was fully qualified for flight and was a solid performer in every phase of airmanship. It also stated that he had an excellent reputation among the aircrew in the squadron.

But, privately within the squadron, several of his buddies knew better, especially when they began comparing notes with each other after the crash. But Shooter was a good egg alright. Too bad someone hadn't told somebody in the chain *before* the accident. If they had, maybe Shooter would still be around serving all those aces *next* summer, along with his B/N. Where were all Shooter's friends – when he needed them most? ◄

Anymouse

A Light Incident That Could Have Been Heavy

An A-6 crew was returning to Homeplate when they discovered that the external lights apparently were not working. On landing rollout, the tower confirmed that all external lights were out except for the top anticollision light. The A-6 taxied into the line area, stopping at the normal hot brake check spot in front of the line (still on main taxiway). A second A-6 landed and taxied inbound by the same route about 2 minutes later. As they cleared the runway, the second A-6 crew called up ground frequency. They were cleared by the ground controller to "switch base frequency, monitor guard," as is standard practice at this base. Ground did not, however, inform the second A-6 that there was an A-6 ahead of them with no external lights. (Note: A-6 anticollision light is not visible from directly behind the aircraft.) Shortly after ground cleared A-6 No. 2 to switch to base frequency, they tried to contact him on ground frequency (3 times), but he had already switched and had not yet returned to ground control frequency. The ground controller then called on GUARD frequency for the second A-6 to "hold your position and come up ground." The second A-6 did stop (about 15-20 feet from A-6 No. 1) and come up ground frequency. Quick thinking by the ground controller plus immediate response by the second A-6 crew averted what could have been a serious mishap.

This incident points out again the need for extra vigilance by all when operating at night. The second A-6 should have been informed of the problem as soon as he came up on ground frequency, but he wasn't. The second A-6 pilot could have been using his taxi light, but he wasn't due to the closeness to the line and ground personnel. A series of minor problems very often come together to produce a major mishap, but in this case the "chain" was broken.

Inthedarkmouse

NATOPS says: Taxi lights should be utilized (tempered by good judgment) for all movements ashore during the hours of darkness.

Trim Trauma

THE instructor was on a fam 12 hop in the T-2C. This hop requires various departures, spins, and recoveries. He had thoroughly briefed his student on the sequence, including the proper requirements and procedures for the spin entry and recovery. Arriving at the spin portion of the hop, a spin was entered at FL230 and appeared to be normal. However, upon application of anti-spin

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

REPORT AN INCIDENT
PREVENT AN ACCIDENT

controls, the aircraft went into a progressive spin. The instructor took over but had no better luck with recovery than the student. He did notice the stick's neutral position to be further aft than normal. Checking the trim gage, he realized that the aircraft was trimmed full noseup. Mumbling incantations that do not bear repeating, he ran the trim back to the proper setting, and the aircraft recovered as advertised. Upon querying the student as they leveled off at 8000 feet, the instructor discovered that the student had used trim "to help hold the nose up" during spin entry. Lesson learned? Just cuz you brief it one way, don't *ever* assume that a student will do it that way.

A postscript to this story was added when the occurrence was related, amidst much hilarity, at an AOM. It was discovered that at least one other instructor had experienced the same thing. Bet it'll happen again, too.

Weakkneedmouse

Missing Oil Cap

THE pilot manned his trusty A-7E after a quick preflight. Departure from NAS West Coast was uneventful. After 20 minutes airborne, the oil light came on and the pilot noted with dismay the oil quantity at one-half. Fortune smiled upon this aviator that day, however, for MCAS Desert was directly ahead and available. The pilot declared an emergency and made an uneventful precautionary landing.

During postflight inspection, the pilot discovered the oil filler cap was off. It was later determined that the engine had lost 8 quarts of oil. Again, fortune smiled on the aviator for there was no engine damage, and he was able to return the aircraft to the squadron, though somewhat delayed.

In retrospect, the pilot recalled only visually checking the cap on preflight, not physically checking it for security. His conviction that it was secured was further supported by not expecting any servicing of the oil system.

This incident was the result of errors and assumptions. The line crew should have informed the pilot that they had serviced the oil system. The pilot should not have expected the cap to be in place. However, the pilot should be commended for not assuming the oil quantity indicator was in error or the problem "deferrable."

Slipperymouse

Near-Miss

WHILE launching on a ready alert at NAS at 0430, the pilot was cleared to taxi to Runway 14L (at crew's request); wind was calm. While taxiing, the P-3 had to come to an abrupt halt to avoid striking a parked Air Force C-130 on the taxiway. The C-130 was camouflaged, had no lights on, had no obstruction markers around it, and its presence was not announced by Ground Control. Only flightcrew attention saved both aircraft from disaster. Ready alert launches are normally characterized by great haste, so the crew was really on the ball. The P-3 had to back up and do a 180 turn to clear the area.

When questioned, Ground Control stated that they were now using a plastic overlay of the field upon which were plotted all obstructions. It is unknown whether the plot was in use at the time of the incident. Additionally, all obstructions are now to be marked with flashers.

I can't believe it happened!!!

ASOmouse

Close the Door!

A P-3 aborted a takeoff when the smoke removal door popped open at 80 KIAS. How did this happen? The daily crew had turned up the auxiliary power unit with the ground air-conditioning in the full hot (manual) position. The aircraft filled with hot fumes. The APU was shut down and the aircraft inspected for evidence of fire. The air-conditioning was found to be set improperly and the situation was corrected. During the troubleshooting, however, the smoke removal door was opened to get rid of the fumes. An AO2 closed the door, but had extreme difficulty in doing so, just barely getting it latched. He did not get it completely locked, nor did he report the door on a MAF!

Fortunately, the door opened at a low enough speed in the takeoff roll that a successful abort was possible. The danger of the situation is clear, though. Doors were made to fit and close securely. If you can't do it, find someone to help.

Abortedmouse

What Happens to Your Ears While Flying

By LTJG Harvey B. Firestone
U.S. Coast Guard Audiologist

NEARLY everyone who flies has experienced a hiss, tingle, pop, sizzle, or gurgle in their ears. Some people don't feel any effects in their ears, while others have ears that "stop up" and become painful. So what happens, and what can you do to prevent ear problems while flying?

The problem you are facing is called barotrauma. "Baro" means air-pressure related. "Trauma" means injury. The problem of air pressure in your ears is introduced by the atmospheric heights the aircraft may travel through. The air pressure decreases when you rise above the earth's sea-level pressure of 14.7 pounds per square inch, which results in expansion of any trapped air. Your ears accommodate by trapping or releasing air in the middle ear.

Some anatomy is helpful in understanding how this occurs (see Fig. 1). The external ear is composed of the pinna which collects sounds and channels them down a semitube closed at one end by the eardrum. This is the external ear canal. The eardrum must vibrate for you to hear by normal air conduction. Sounds can only occur in a medium elastic enough (like air) for vibration of the eardrum and the three small bones – hammer, anvil, and stirrup (which, incidentally, are the smallest bones in the human body). As the medium changes, so does our hearing – ever notice how you hear under water? If wax blocks the channel, or rests on the eardrum, it naturally impedes the flow of sound and vibratory transmission. This changes the pathway, but not the medium. Inserting an earplug can quell noise by air transmission pathway reduction just as well. We need air on both sides of the eardrum to allow our ears to function properly.

Dizziness may occur due to barotrauma to the fluids and cells of the semicircular canals, which generally control our labyrinthine function and affect our sense of balance.

Hearing may be your only problem. Cabin attendants may advise you to hold your nose and blow, or yawn very widely. This is good advice because the middle ear needs air to equalize itself. The only way to provide air to the middle ear is through the Eustachian tubes of each ear. These tubes connect the middle ear with the superior aspects of the epipharnyx – uppermost throat region. The 19-letter (count 'em) salpingopharyngeous muscle attaches to the pharyngeal ostium of the auditory tube, opening and closing the flapper valve – like structure when yawning or swallowing (Fig. 2). Equalizing pressure enhances sound transmission, resolves balance problems, and decreases the amount of mucous membrane seepage of the middle ear.

Problems arise in equalizing pressure when a cold settles in our head and our ears get stuffy. This is due to the swelling of the mucous membrane lining of our middle ear and throat. This often is enough to encompass the area around the opening of the Eustachian tube with enough swelling to close it off and reduce the salpingopharyngeous actions of air exchange.

The reason ears "beep" is due to the negative air pressure sucking on our eardrums. Audiologists (specialists in hearing conditions) and otologists (surgeons of the ear) who peer into an ear can see an imploded eardrum – indicative of middle ear problems. You can feel temporary, slight pain from barotrauma when the ligaments holding the three bones and the eardrum are stretched.

Now, here is the action phase of what you can do to overcome barotrauma. Swallowing normally opens Eustachian tubes. Chewing increases saliva, and the consequent increased swallowing is enough to induce barometric equalization. This is why chewing gum is often given to airline passengers. (But it sure can "gum up" the valves of an oxygen mask!)

Yawning is a completely safe method of middle ear equalization, but it doesn't work for everyone. If yawning doesn't work, you can hold your nose and gently swallow or blow or alternate those procedures until your ears clear.

You should be careful when you do this, however. If you are running a cold or other upper respiratory infection of any sort, you risk infections of the middle ear by attempting equalization by any method but yawning. An alternate – although infrequent – method of middle ear barometric equalization is to visit the otologist's office to have him pass a silver tube through the nose to the Eustachian tube and middle ear. Air is passed up the catheter to gently inflate the middle ear. This procedure is called a bouginage. For the most severe ear blocks, the surgeon is required to lance a minute hole in the eardrum (called a myringotomy). This can be accomplished only by a visit to the physician.

Two ways to know if you are susceptible to barotrauma are by flying or low-pressure chamber training and trying to

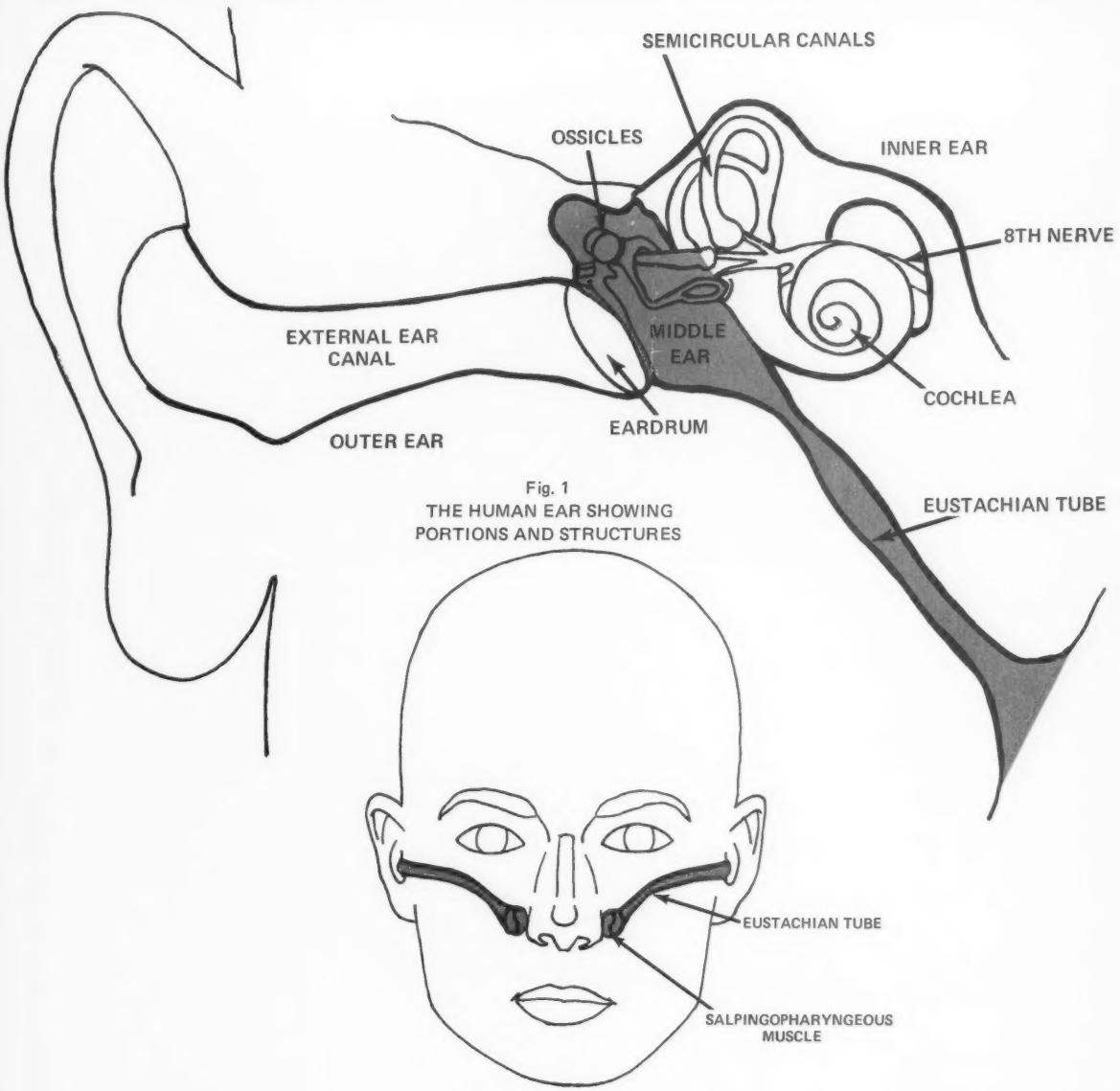


Fig. 1
THE HUMAN EAR SHOWING
PORTIONS AND STRUCTURES

Fig. 2
SALPINGOPHARYNGEOUS LOCATION
AND EUSTACHIAN TUBES

clear your ears. Whatever technique you find that works consistently is reasonable. But be careful. Blowing those eardrums outward from their inward position too many times will cause your eardrum to weaken by stretching. The strained ligaments of the ossicles may cause pain. Your hearing may be temporarily dulled, or if there is enough pressure, you might blow a hole in your eardrum.

So be gentle on yourself. You may be able to equalize one ear only with one technique, while holding the nose and swallowing, or yawning works fine for the opposite ear. The best advice, of course, is not to fly at all when you have a stopped-up head and ears.

Good luck and happy flying. If you have an ear block now and can't hear, at least you can read! ◄

Blown tire! Fire on the ground! Emergency egress! No, this wasn't the result of a poor landing on my part. In fact, it didn't even occur to a military aircraft. But it sure did teach me a lot about . . .

Passenger Preparedness

By CDR Brian Shoemaker
CO HSL-35

AS aviators, we are all trained and ready to handle emergencies in our particular aircraft, but how many of us are prepared to cope with emergency situations when we are flying as passengers in other aircraft? As professionals, we should be as prepared for these emergencies as we are for emergencies which develop in the aircraft which we are piloting, for we can wind up just as dead if we are not.

To illustrate my point, let me relate the events which transpired while I was a passenger on a commercial flight. I was traveling from San Diego to Dulles International in execution of TAD orders to NAVAIRSYSCOM. The flight aboard a Boeing 727 included a passenger stop in Dallas. Boarding and seating were normal. As I stepped inside, I made a remark to the pilots to leave the flight attendants to me and to be careful with their checklists.

After strapping in, as we began to taxi, the stewardess explained where the emergency exits were. I noted that she had an exceptionally good figure. When she demonstrated how to don the flotation gear, I noticed her attractive blue eyes. As she held up the card which explained egress routes and emergency procedures, I was speculating if she would stay with us all the way to DC.

The flight was uneventful from San Diego to Dallas. Certainly much more relaxing than strapping into a Navy cockpit. Before landing at Dallas, we were requested to "fasten seatbelts and bring our seats to the full upright position."

Touchdown at Dallas International was normal – then the left tire blew! There were three "thumpity-thumps" as the wheel rolled around on the flat. Then the wheel froze and the pilots reversed thrust on the starboard engine to keep the aircraft from swerving off the runway. I could see sparks from under the wing from my seat on the left side of the aircraft. The plane came to a rest on the runway, canted over to the left. The pilots had done a fantastic job keeping it on the centerline!

Then we were ordered to evacuate the aircraft – fast! Everyone jumped up and headed for an exit, bumping into one another. I was in the row behind the left rear wing emergency exit. The fellow in the seat next to the hatch bent over to read the instructions on how to get it open. I reached over and jerked off the hatch, and we both shoved it down between the seats. He exited onto the wing followed by myself and several others. Then we saw the fire lapping up the flap where we were going to slide down! We had no idea of how to get off. Someone panicked and started to yell "Fire!" We all started back into the aircraft to seek another exit against the flow outside. We finally got the tide turned around and managed to get back in. Once inside I looked at the crowd trying to get out onto the right wing – a real traffic jam. I heard the stewardess shouting up front. She was standing next to the forward door gesturing frantically for someone in the crowd to exit this way. I grabbed two bodies and headed them towards the forward door. We all tumbled down the rubber chute and then ran about 50 yards away from the plane.

Everyone else got out all right. No one was hurt, and the fire department put out the fire (ignited by the sparks which lit the hydraulic fluid spilling from ruptured lines and the tires which started to burn). The potential for a major disaster was definitely there, and we were very lucky.

We were all taken care of by the airline at Dallas. When we received our luggage from the damaged aircraft, we boarded a second 727 for Washington, DC.

As we taxied out, the stewardess went through her spiel, and those of us who started out in San Diego paid rapt attention. We even read the egress cards and looked around for the emergency exits. Some even asked questions. The passengers who boarded in Dallas thought we were crazy!

SPIN TRAINING COMES OF AGE

By Richard P. Shipman
APPROACH Writer

"ESTABLISH yourself at 275-300 KIAS at 20,000 feet, put on 3-4Gs, and pull the aircraft to 80-100 degrees noseup going to IDLE passing 45 degrees nose high. At 200 KIAS, relax the pull and put in full right aileron. After 180 degrees of roll, apply full right rudder. After 360 degrees of roll, apply full forward and full right stick followed by full left rudder. Then . . . hang on!"

Surely this contemplated maneuver must be the result of some pilots fooling around in a simulator. Well, it's not! The maneuver being briefed above is a carefully planned, closely supervised, and routinely executed 3-axis coupled entry into an inverted spin – and it's being done regularly in the T-2 *Buckeye* by average Fleet pilots. What possible need is there to put a real aircraft into such a gut-wrenching, unnatural maneuver as this? A very real need. And Fleet pilot spin training at the Test Pilot School, Patuxent River, is meeting that need.

The requirement for some type of out-of-control flight training has been recognized for some time. Statistically, the Navy has been having about 20 accidents a year due to out-of-control flight. The cost in lives and equipment due

to these accidents is appalling. Standard out-of-control flight reaction seems to be panic followed by ejection.

This reaction should not really be unexpected. For most jet pilots, spin training was limited to several spins as part of the primary and basic phases of flight training. Periodically, various other attempts were made to fill the spin training void, such as "traveling road shows" conducted by spin experts at TPS (Test Pilot School). They would lecture at squadrons and give spin flights to a selected few pilots. But for the majority of pilots, this limited, basic spin training was not sufficient for them to overcome the disorienting, confusing, and frightening effects of a spin they entered unintentionally and unexpectedly.

The answer has never been to stop flying tactical aircraft close to limits of their controllability. Flight at high angles-of-attack is an inherent part of offensive and defensive maneuvering. Reluctance to operate in this regime because of possible departure from controlled flight certainly limits the capability of the machine to deliver its maximum performance. Pilot confidence is the key to effectively operating close to control boundaries. And confidence is a function of the pilot's ability to correctly analyze and easily recover from the occasional out-of-control condition associated with high AOA maneuvering. Thus the need for spin training.

A conference on out-of-control flight was held in 1975 that once again recognized the problem and identified the need for a thorough and comprehensive spin training program. This time, some action resulted. The Naval Test Pilot School, which already routinely spun aircraft as part of its TPS curriculum, was selected as the logical site for the spin training program. A syllabus was established, and shortly thereafter, five pilots a month started training.

Those pilots who arrive for spin training expecting a "quick and dirty" back seat demo of a few spins quickly find out this is not the case. All aircrews going through the course are put into the front seat and fly the majority of the hop. As the aircraft tip tanks are being transferred, the student "limbers up" mentally by performing aircraft stalls, negative G/inverted flight, and high angle-of-attack maneuvering. During the high AOA flight, the pilot explores aircraft controllability using the various flight controls and observes the effect of adverse yaw caused by aileron in extreme slow speed flight. With the tips transferred, the spins begin.

The student performs about 10 spins, including inverted spins, entered from a variety of maneuvers. The purpose of the variety of spins is to give the pilots exposure to out-of-control conditions and to teach them to interpret the critical gages necessary to analyze their aircraft's condition, even under the most adverse flight gyrations.

Marine Captain T. E. "Tut" Fitzpatrick, one of the four spin instructors currently at TPS, explains the importance of analyzing the gages during out-of-control flight.

"One of the primary reasons for out-of-control aircraft losses is premature application of aircraft controls. Instead of neutralizing controls during the departure and poststall gyration phases, the typical pilot becomes panicky and goes immediately to his well-rehearsed spin recovery procedures. If he wasn't in a spin before, this will almost guarantee that he goes into one. The next step is frequently ejection.

"Therefore, one of our primary goals is to teach the pilot to look at the critical gages – AOA, turn needle, and airspeed – to determine first whether he is really in a spin or just a steep spiral dive. If he is in a spin, then the pilot needs to go to his gages to determine the direction of spin and what type of spin it is – upright or inverted.

"Quite a few students express surprise when I tell them they *have* to go to the gages to get this information; they just can't trust outside references or seat-of-the-pants judgments. Maybe they can in the classic erect spin they practiced in the T-34, but believe me, you don't know what end is up or where you are in an inverted spin – unless you can read the gages."

The spin training program begins with a brief that is anything but brief. All aspects of the flight are covered thoroughly, including hazards unique to spins: nonsecure harness restraints, excessive fuel venting, inadvertent engine shutdowns, and fuel starvation in inverted flight, for example. The instructor then moves into a discussion of the various spins that will be done, emphasizing the purpose of each maneuver and what procedures to use to obtain maximum learning. The brief concludes with an escape system summary, although the instructor does the actual preflight of the seat.

The second phase of ground training includes slide/sound tapes, movies, and lectures about the basic principles of stalls, departures, and out-of-control flight. The scope of the presentation is obviously not of the extent given to the test pilots undergoing the training. Nevertheless, the material offers worthwhile background information that gives the Fleet aviators a clearer understanding of the aerodynamics of spin recovery procedures used in their aircraft.

The program is completed with the flight. The T-2 was selected as the spin vehicle for several reasons. Its spin characteristics are reliable and predictable, yet it can be made to spin in just about any mode typical of Fleet aircraft. The aircraft's simplicity makes it possible to put the student into the front seat with minimal indoctrination, and the bird's fuel specs allow maximum spin training in one flight. Finally, the aircraft's recovery characteristics are such that *any* spin recovery method used in Fleet aircraft can be used to recover the T-2. This makes the training that much more meaningful and realistic.

Despite the relatively high risk of this type of training, the safety record of the spin program at TPS has been outstanding. The one accident so far involved the loss of part of a *Buckeye's* horizontal stabilizer. This failure was traced to structural weakening in this area due to the unusual stresses placed upon it during spin training. As a result of this mishap, the tail section of the T-2s are now visually inspected after every spin flight, and the tail is pulled for X-ray after 10 flights. The excellent safety record of the spin program is testimony to the professionalism of the instructors and the thoroughness of the syllabus.

The main limitation of spin training as it currently exists is the small number of students the school can accommodate. (NFOs have been included in the training, putting further demands on the school.) TPS received no additional aircraft or instructors to meet the new requirement, and the spin instructors must continue to meet the many other requirements of their jobs at TPS. This, coupled with the TAD expenses – particularly for west coast squadrons – dictated the need to establish other spin training programs. With this in mind, plans are underway to integrate spin training into VF-126 on the west coast and VF-43 on the east coast. Students coming through these squadrons for their instrument evaluations would then go right into the spin program.

Simply establishing a spin program at the Instrument RAGs will not, by itself, guarantee that out-of-control aircraft losses will be significantly lessened. The key to an effective and safe spin training program is a professional, dedicated, and conscientious approach to that training. If spin training is relegated to "just another X in the box," the value of that training will diminish significantly while the risk will increase. The challenge for VF-126 and VF-43 will be to maintain the level of instructor competence and motivation presently displayed by the spin instructors at TPS. TPS will maintain the instructor training role, but the day-to-day running of the program will be left to the squadron. Considering this, several important questions need to be addressed. Will instructors shy away from the physically and mentally demanding spin hops in favor of the easier instrument hops and more enjoyable ACM missions? Will aircraft availability allow instructors to stay truly current and proficient in spin instructing? Will student workload permit thorough and comprehensive briefs and flights?

Spin training, as it is being done at TPS, has come of age. If the program can be maintained effectively, it will provide invaluable training that will undoubtedly decrease the Navy's out-of-control aircraft losses. If not, the program will revert to a high-risk evolution with decreased benefits.

Letters

A Safety Petty Officer Asks, "Why Me?"

FPO, San Francisco – I've been a safety petty officer for about a year and enjoy my job because it's challenging. However, sometimes I sit at my desk and wonder what I'm doing in this billet.

It all started when we were deployed. The safety officer asked me if I'd like the billet. Our safety petty officer at the time had to return to Homeplate. I was interested, after learning about the job responsibilities and duties. Also, I knew I'd have to take the job as collateral duty. I accepted and was given a cursory checkout in the shortest time possible. I relieved the gent while escorting him topside to the COD. He left, and I was it!

I began by reviewing the reports and forms that had to be submitted, started familiarizing myself with the areas to be looked at, and reviewed the problems most commonly encountered. I realized quickly I didn't know very much. Sure, I was a senior petty officer and had worked the flight deck for quite awhile, but it just wasn't enough. I used common sense for a lot of the problems, but I didn't know that much about ship operations and handling, storage of dangerous materials, safety prevention programs, and many other aspects. I got by with lots of help from my squadron safety officer and the ship's safety team.

After we returned from deployment, I was permanently assigned the job and began to develop new programs and improve old ones. A whole new group of areas appeared, such as flight line safety, drive-safe programs, structural fire codes, and GSE safety. Most of it meant back to the program of self-education again.

I'm not the only one faced with this problem, nor will I be the last one. Many ships, squadrons, and station safety petty officers have to educate themselves to do their jobs. The self-education process is too time-consuming to carry out a good safety program. Others have asked, "Why me?" The reason is simple: someone has to do the job. But without proper training? Most officers have gone through an extensive training program, but we are left to our own devices. There must be a better way.

A01 T. L. Hand
Safety Petty Officer
VF-1

• CNO – after receiving numerous recommendations from Fleet, air-type, and training commanders – issued a policy message (CNO 281617Z Jun 77) outlining the authorization, role, billet description, and training requirements for aviation squadron safety petty officers. Listed in the qualifications section of the policy statement were the following requirements:

• Mature, highly motivated, career designated PO.

• Group IX rate, pay grade E-6 or above.

• Selected by CO.

• Be a graduate of a traffic safety instructor course (if possible).

• Be a graduate of a Safety Supervisor Course at FTC San Diego or Norfolk, VA (K-493-2009) or equivalent correspondence safety training courses. The formal Safety Supervisor Course (3 to 5 days) or correspondence courses (such as the U.S. Army courses AVN-570, AG-39, -40, -41, -45, -121, -531) shall be completed as soon as possible following safety PO selection.

The present 3-day Shipboard Safety Supervisor Orientation Course (K-493-2099) curriculum at FTC San Diego is being lengthened to 5 days and is being modified to meet the hazard awareness training needs of aviation squadron personnel as well as their black-shoe contemporaries. (COMTRALANT is presently conducting the 3-day course.)

Kudos

Arlington, TX – The article, "Safety Is Not a Word Game," in the FEB '78 issue struck a responsive chord and gave me more than a little twitch of nostalgia. When I was CO of the same squadron (then known as VF-703), I was assigned a young, red-haired jaygee with an A-4 background. He was soft-spoken, quiet, almost shy to the point of bashfulness. In no time at all we discovered that he was an absolute jewel – aggressive in the air, competent and capable on the ground, quick to learn. On the carrier during the '68 Reserve recall, he flew his passes on "rails." During ACM he was super-tough as an opponent and a whiz of a wingman. He followed the rules, both letter and spirit, and he used his head when the rules didn't cover the situation.

That young jaygee is now a lieutenant commander and the author of the article. With his characteristic modesty, Johnny Bittick gives all the credit for VF-202's outstanding safety record to others. But I happen to know that his own strong personal influence has made a tremendous contribution. If I were to define all those characteristics that I consider essential or desirable in a squadron safety officer, I would use him as the perfect example. In the vernacular of my ancestors, "He had respect." Bravo Zulu, VF-202, Sierra Hotel, John.

CAPT Frank A. Liberato, USNR (Ret.)

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, VA 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

The Case for Cotton

NAS Chase Field, TX – Recently I saw two young student naval aviators in the exchange. It was cold that day, and they were both wearing sharp-looking turtleneck sweaters under their flight suits.

I passed them and spoke to them, hurrying about my business. It wasn't until I got back to my desk that I *thought* about these sharp turtleneck sweaters.

When I did, a chill ran through me which had nothing to do with the weather. They brought back memories of another cold, blustery day when I flew a squadronmate out of a landing zone where he had planted his helicopter a bit too firmly.

His *Nomex* flight suit was like old newspaper and fell apart as his crew helped him into the MedEvac ship – but it was still there. His gloves were wrinkled and stiff – but still there. His hardhat was streaked with soot; paint and tape peeling off; visor wrinkled from the heat – but still there. His sharp-looking acrylic fiber turtleneck sweater . . . (We had all admired it, "Next best thing to a white silk scarf," we said.) Well, it was gone! In its place he was wearing a hideous plastic collar, solidly fuzed to his skin!

He eventually rejoined the squadron after I left (nearly a year later), and I hear he still wears a turtleneck most of the time to cover the scars. He tells everyone he meets about his experience and assures them that now his underwear is 100 percent cotton and his sweaters are wool or *Nomex*. No more fancy stuff!

Those of us who have been in naval aviation more than 20 years can remember the slow process of change which brought us from plain cotton flight suits to fire-retardant-treated ones to *Nomex*. An awful lot of hideous burns caused more pain than we like to remember before we got where we are today, and we are still making progress.

In the meantime, until the totally safe, fireproof aircraft arrives and our JP burners are all gone, we can do something to help ourselves and our students.

All aircrews should understand the risks associated with synthetic fibers when fire is a possibility. Many CVWs simply forbid undergarments which contain more than 2 percent synthetic fibers. That's probably a pretty good gage. Let's train our aviators right, starting here in the training command.

CDR James L. Keyes
AIMD Officer

Sparks on the Hangar Deck

FPO, San Francisco – During a recent in-port upkeep period, I noticed a potentially dangerous situation occurring in the hangar deck of the carrier our squadron is deployed on. The problem centered around the grinding of the hangar deck surface in preparation for resurfacing. This was taking place close to aircraft where fuel leaks are neither abnormal nor uncommon. Navy Safety Precautions for Forces Afloat (OPNAVINST 5100.19), Chapter 3, Sections 1 and 3, addressed this problem indirectly. The above reference discusses smoking, open flames, and other "sources of ignition" in the vicinity of fumes or flammable materials. What we are dealing with is grinding work taking place within 15 feet of JP-5 in parked aircraft and fueling equipment. The rust removal results in sparks up to 20 inches long. My question is: do these sparks qualify as a source of ignition? If so, does a legitimate safety hazard exist, and are any realistic courses of action open that can reduce or eliminate this hazard?

AT2 Bryan K. Billenstein
HS-8

● The Fire Protection Handbook, published by the National Fire Protection Association, has this to say about friction sparks (sparks created by impact between two hard surfaces, at least one of which is metal):

"The practical danger from mechanical sparks is limited by the fact that usually they are very small and have a low total heat content, even though they may have a temperature of 2000°F or higher. They cool quickly, and start fires only under favorable conditions, such as when they fall into loose, dry cotton, combustible dust, or explosive materials.

"Although the hazard of ignition of flammable vapors or gases by friction sparks is often overemphasized, it is best to avoid the use of grinding wheels and other sources of mechanical sparks in areas where any flammable liquids, gases, or vapors are or may be present. The possibility of ignition due to some unusual condition should not be overlooked."

JP-5 is a fuel of low volatility and high flashpoint. Thus, the likelihood of grinding sparks igniting JP-5 appears limited. However, as you are well aware, the hangar deck usually has quite a few rags and other materials that could be saturated with fuels and become quite volatile. To be on the safe side, grinding should probably not be done close to fueled aircraft, and definitely not done where the sparks will shower rags and other flammable materials.

As far as action you can take, we suggest you bring this matter to the attention of the ship's safety department. And, as always, good housekeeping procedures within your squadron (cleaning up all fuel spills, disposing of rags and other cleaning materials properly, etc.) will go a long way to reduce the chance of deadly shipboard fires.

Is the G Suit Mandatory?

NAS Meridian, MS – Here at Meridian we are in the business of training future naval and marine aviators. NATOPS violations do not go unnoticed by the students. On four occasions it has been pointed out by my students while we were taxiing out for takeoff that transient aircrews didn't have any G suits on. I explained it by saying that they are not very safety conscious and they are not supporting their command in that they are violating NATOPS. In 1971 the XO of the Fleet squadron that I was in was killed. He did not have his G suit on, and I'm sure it was a contributing factor. The ops officer of the commands that let their pilots fly without G suits are not doing their job. I personally try to set a good example, particularly in a student training environment, and I think everyone else should too.

Name Withheld

● OPNAVINST 3710.7H, para 706, reads as follows: "Antiblackout suits shall be worn and connected in aircraft equipped for their use on all gunnery, dive bombing, rocket, strafing, air combat maneuvering, and acrobatic flights, and on all other flights where high G forces may be encountered." As we read this directive, it implies that G suits do not have to be worn for flights such as cross-country instrument training flights where high G forces would not be encountered. Therefore, the pilots you observed without G suits were not in violation of NATOPS unless they were combining their cross-country flight with some other mission involving high G flight.

Vol. 23 No. 11 NAVAIR 00-75-510

approach

Pg. 1

Pg. 12

1 The Pilot in Command Is Responsible
6 The Breaks Without Brakes
7 A Part of Chuck Is Missing
By VS-22
8 Unsymmetrical Recirculation Effects
By LT Emmett J. Lancaster
12 An "APC" for Aviation Headaches
By LCDR Robin Springer
14 C-118 Hydraulic Failure
16 Imprecise Precision Approach
By LT Michael Gillespie
18 A Matchless Mishap
19 Reflections of an Old, and Bold, Pilot
By CDR Tom Myers
20 A Friend in Need
By LT Ted Robinson
24 What Happens to Your Ears While Flying
By LTJG Harvey B. Firestone
26 Passenger Preparedness
By CDR Brian Shoemaker
27 Spin Training Comes of Age
By Richard P. Shipman

Pg. 20

DEPARTMENTS

4 Air Breaks
11 Bravo Zulu
22 Anymouse
30 Letters

A Naval Safety Center Publication

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CREDITS/The S-3A *Viking* is the subject of this month's cover painting by staff artist Blake Rader. Introduced to the Fleet as a replacement for the S-2 *Tracker*, the *Viking* brings increased capabilities to the Navy's ASW forces.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1978—735-047/05

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A2-OS-178

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